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EXAMINER	
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ART UNIT	PAPER NUMBER
2644	10

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/576,039	PHELPS, ANDREW	
	Examiner	Art Unit	
	Con P. Tran	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Acknowledgment is made of applicants' claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. UNITIED KNGDOM 9913848.9 , filed on June 14,1999.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 10-13, and 19** are rejected under 35 U.S.C. 102(b) as being anticipated by Ricoh JP60-075199 (cited by Applicant, hereinafter, "Ricoh' 199")

Regarding **claim 10**, Ricoh' 199 teaches an audio apparatus (see Abstract, Fig. 3, and Fig. 4) comprising:

a modulator (multiplier 7) for modulating a first ultrasonic signal (i.e., carrier) with an audio signal (signal source 1) to provide a second ultrasonic signal (i.e. multiplied signal); a transducer (wave vibrator array 9) for converting

the second ultrasonic signal (multiplied signal) into an ultrasonic pressure wave for transmission into a non-linear medium (i.e., air) to allow demodulation (irradiating a modulated wave, and reproducing a audible tone, i.e., demodulating) of the ultrasonic pressure wave and thereby generate an audio pressure wave representative of the audio signal (audible tone, Abstract, lines 3-4, lines 14-15; Machine Translation page 9) signal wherein the transducer has conversion characteristics that determine a relationship of the ultrasonic pressure wave to the second ultrasonic signal (e.g., degeneration of 2nd harmonic-distortion of frequency characteristics, Machine Translation, Figs. 1, 2, pages 8-9); processing means (square root converter 5) for modifying the audio signal to compensate for the demodulating properties of the non-linear medium (see Abstract, lines 8-9, lines 14-15); and double integral (10, Fig. 4) for modifying the audio signal to compensate for the conversion characteristics of the transducer (9; double integral increases amplitude of modulating signal thus increasing amplitude of 2nd harmonic audio output; see Machine Translation, pages 12-13, and pages 25-26). It should be noted that though double integral does not provide flat frequency response characteristics, it still compensates.

Regarding **claim 11**, Ricoh' 199 further teaches wherein the first ultrasonic signal is amplitude modulated with the audio signal (see Machine Translation, page 9, Constitution section)

Regarding **claim 12,** Ricoh' 199 teaches audio apparatus according to claim 10. Ricoh' 199 further teaches wherein the first ultrasonic signal is equal to or greater than 40 kHz (upper sideband of double sideband having center frequency at 40 kHz (see Machine Translation, page 8).

Regarding **claim 13,** Ricoh' 199 further teaches audio apparatus according to claim 10, wherein the processing means comprises a double integration filter (10) and a square root operator (5; see Fig. 4, and respective portions of the specification).

Regarding **claim 19,** this claim is essentially similar to Claim 10 and is rejected for the reasons stated above regarding that claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 14-15, and 20-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over of Ricoh JP60-075199 (cited by Applicant, hereinafter, "Ricoh'

199") in view of Nippon Columbia JP-58-119293 (cited by Applicant, hereinafter, "Nippon' 293").

Regarding **claim 14,** Ricoh' 199 teaches audio apparatus according to claim 4. However, Ricoh' 199 does not explicitly specify wherein the means for modifying is disposed between the double integration filter (10) and the square root operator (5; see Fig. 4, and respective portions of the specification).

Nippon' 293 teaches an electroacoustic transducer in which equalizer (4, Fig. 2), located between modulator (6) and program source (3), to smooth (i.e., modify) frequency response characteristics of for compensating transducer output (see Abstract, Figs. 2, 3, 4, 5, and respective portions of the specification).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made to incorporate the Nippon' 293 teaching with Ricoh' 199 by locating equalizer (4, Fig. 2) for purpose of having smooth frequency characteristic over a broad band of an audible frequency band, as suggested by Nippon' 293 in Abstract, lines 1-2.

Regarding **claim 15,** Ricoh' 199 further teaches audio apparatus according to claim 1. However, Ricoh' 199 does not explicitly disclose wherein the means for modifying is a digital filter.

Nippon' 293 teaches an electroacoustic transducer in which equalizer coefficient is expressed in Equation III (4, Fig. 2) and follows program source (3, Fig. 2; see Abstract).

Regarding **claim 20,** Ricoh' 199 teaches an audio apparatus (see Abstract, Fig. 3, and Fig. 4) comprising:

a modulator (multiplier 7) for modulating a first ultrasonic signal (i.e., carrier) with an audio signal (signal source 1) to provide a second ultrasonic signal (i.e. multiplied signal); a transducer (wave vibrator array 9) for converting the second ultrasonic signal (multiplied signal) into an ultrasonic pressure wave for transmission into a non-linear medium (i.e., air) to allow demodulation (irradiating a modulated wave, and reproducing a audible tone, i.e., demodulating) of the ultrasonic pressure wave and thereby generate an audio pressure wave representative of the audio signal (audible tone, Abstract, lines 3-4, lines 14-15; Machine Translation page 9) wherein the transducer has conversion characteristics that determine a relationship of the ultrasonic pressure wave to the second ultrasonic signal (e.g., degeneration of 2^{nd} harmonic-distortion of frequency characteristics, high pitch becomes deep; Machine Translation, Figs. 1, 2, pages 8-9); processing means (including square root converter 5 and double integral (10, Fig. 4) for modifying the audio signal to compensate for the demodulating properties of the non-linear medium (see Abstract, lines 8-9, lines 14-15).

However, Ricoh' 199 does not explicitly disclose a digital filter wherein the means for modifying is a digital filter for modifying the audio signal to compensate for the conversion characteristics of the transducer.

Nippon' 293 teaches an electroacoustic transducer in which equalizer (4, Fig. 2) having coefficient is expressed in Equation III (4, Fig. 2) and follows program source (3, Fig. 2; see Abstract; i.e., equalizer is a digital filter); the equalizer smoothens (i.e., modify) frequency response characteristics of for compensating transducer output (see Abstract, Figs. 2, 3, 4, 5, and respective portions of the specification).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made to incorporate the Nippon' 293 teaching with Ricoh' 199 by locating equalizer (4, Fig. 2 of Nippon' 293) between the double integration filter (10) and the square root operator (5 of Ricoh' 199) for purpose of having smooth frequency characteristic over a broad band of an audible frequency band, as suggested by Nippon' 293 in Abstract, lines 1-2.

Regarding **claim 21,** Ricoh' 199 in view of Nippon' 293 teaches audio apparatus according to claim 20. Ricoh' 199 further teaches wherein the first ultrasonic signal is equal to or greater than 40 kHz (upper sideband of double sideband having center frequency at 40 kHz (see Machine Translation, page 8).

Regarding **claim 22,** Ricoh' 199 in view of Nippon' 293 teaches audio apparatus according to claim 21. Ricoh' 199 further teaches wherein the processing means comprises a double integration filter (10) and a square root operator (5; see Fig. 4, and respective portions of the specification).

Regarding **claim 23,** Ricoh' 199 in view of Nippon' 293 teaches audio apparatus according to claim 22. However, Ricoh' 199 does not explicitly specify wherein the means for modifying is disposed between the double integration filter (10) and the square root operator (5; see Fig. 4, and respective portions of the specification).

Nippon' 293 teaches an electroacoustic transducer in which equalizer (4, Fig. 2), located between modulator (6) and program source (3), to smooth (i.e., modify) frequency response characteristics of for compensating transducer output (see Abstract, Figs. 2, 3, 4, 5, and respective portions of the specification).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made to incorporate the Nippon' 293 teaching with Ricoh' 199 by locating equalizer (4, Fig. 2) for purpose of having smooth frequency characteristic over a broad band of an audible frequency band, as suggested by Nippon' 293 in Abstract, lines 1-2.

Regarding **claim 24,** Ricoh' 199 in view of Nippon' 293 teaches audio apparatus according to claim 20. Nippon' 293 further teaches wherein the characteristics of the means equalizer (4, Fig. 2) for modifying are empirically derived by tone adjustment (equalizer smoothens frequency response characteristics of for compensating transducer output (see Abstract, Figs. 2, 3, 4, 5, and respective portions of the specification).

5. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over of Ricoh JP60-075199 (cited by Applicant, hereinafter, "Ricoh' 199") in view of Tanaka et al. U.S. Patent 4,823,908 (cited by Applicant, hereinafter, "Tanaka").

Regarding **claim 16,** Ricoh' 199 teaches audio apparatus according to claim 10. However, Ricoh' 199 does not explicitly disclose wherein the characteristics of the means for modifying are empirically derived by tone adjustment.

Tanaka teaches a parametric loudspeaker system wherein the characteristics of the means for modifying are empirically derived by tone adjustment (see Fig. 22, 23, 24, 26, and respective portions of the specification; col. 12, lines 43-53).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to incorporate the Tanaka teaching with Ricoh' 199 for purpose of providing with an acoustic filter capable of permitting the passage of only the audio frequency, as suggested by Tanaka in column 4, lines 34-36.

6. **Claims 17 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over of Ricoh JP60-075199 (cited by Applicant, hereinafter, "Ricoh' 199") in view of Akerman et al. U.S. Patent 5,539,705 (hereinafter, "Akerman").

Regarding **claims 17 and 18,** Ricoh' 199 teaches audio apparatus according to claim 10. However, Ricoh' 199 does not explicitly disclose the audio apparatus comprising a radiotelephone, a portable radio device. Akerman teaches a portable wireless communication system which includes an ultrasonic receiving (200, Figs. 1, 4; col. 7, lines 35-50, col. 9, lines 17-26).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to incorporate the wireless communication system of Akerman teaching with the audio apparatus of Ricoh' 199 for purpose of providing a transducer that is designed to unique size and performance specifications as suggested by Akerman in column 4, lines 10-12.

7. **Claims 25 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over of Ricoh JP60-075199 (cited by Applicant, hereinafter, "Ricoh' 199") in view of Nippon Columbia JP-58-119293 (cited by Applicant, hereinafter, "Nippon' 293") and further in view of Akerman et al. U.S. Patent 5,539,705 (hereinafter, "Akerman").

Regarding **claims 25 and 26,** Ricoh' 199 teaches audio apparatus according to claim 200. However, Ricoh' 199 in view of Nippon' 293 does not explicitly disclose the audio apparatus comprising a radiotelephone, a portable radio device. Akerman teaches a portable wireless communication system (20) which includes an ultrasonic transmitting (100) and receiving (200, Figs. 1, 4; col. 7, lines 35-50, col. 9, lines 17-26).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to incorporate the wireless communication system of Akerman teaching with the audio apparatus of Ricoh' 199 for purpose of providing a transducer that is designed to unique size and performance specifications as suggested by Akerman in column 4, lines 10-12.

Response to Arguments

8. Examiner thanks Applicant for the Machine Translation of Ricoh' 199. Applicant's arguments with respect to claims 10 -26 have been considered but are moot in view of the new grounds of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory

action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Con P. Tran, whose telephone number is (703) 305-2341. The examiner can normally be reached on M - F (8:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Customer Service Office at telephone number (703) 306-0377.

cpt CPT
July 9, 2004

FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER